

REMARKS

In view of the foregoing amendments and the following remarks, Applicants respectfully request reexamination of the present application. Claims 143, 144 and 149 have been amended, no claims have been cancelled and new Claims 168-172 have been added.

The Examiner has acknowledged several preliminary amendments filed with respect to the above-identified application and has indicated that such preliminary amendments have been entered. Applicants note that a Preliminary Amendment was also mailed on January 5, 2005, to correct a typographical error on page 1 of the specification. Applicants also request acknowledgment of this Preliminary Amendment.

The Examiner has rejected Claim 149 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Examiner states that the dependency of this claim appears to be mistaken and that as presently drafted, the term "said dielectric material" lacks proper antecedent basis. The Examiner states that for the purposes of examination, Claim 149 will be treated as being dependent on Claim 148. Applicants have amended Claim 149 to be dependent from Claim 147, and removal of this rejection is requested.

The Examiner has rejected Claims 143, 144 and 147-152 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 3,673,092 by Dietz. The Examiner states that Col. 7, lines 6-50 of Dietz discloses forming a paste including particles 2-3 microns in size and comprising 17.6% Pd, along with various dielectric oxides including titanium oxide, and a liquid organic vehicle. The Examiner also states that the combined pastes are fired at 875°C to form a coating onto a ceramic substrate.

The Examiner admits that Dietz does not disclose the crystallite size recited in instant Claim 143, the oxidation resistance value (under thermogravimetric analysis or any other method) recited in instant Claim 143, or the size distribution limitations recited in instant Claim 144. The Examiner also states that these differences are not seen as resulting in a patentable distinction between the prior art and the claimed invention.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

Objective evidence of secondary considerations such as unexpected results . . . are relevant to the issue of obviousness and must be considered in every case in which they are present. When evidence of any of these secondary considerations is submitted, the Examiner must evaluate the evidence. The weight to be accorded to the evidence depends on the individual factual circumstances of each case. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983). The evidence relied upon should establish that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance. *Ex parte Gelles*, 22 USPQ 2d 1318, 1319 (BPAI 1992).

With respect to independent Claim 143, Applicants submit that the palladium-containing particles disclosed by Dietz do not have the resistance to oxidation of the palladium required by the claim. It is well known in the art that palladium is highly susceptible to oxidation. This is discussed in the present application and is also supported by the disclosure of U.S. Patent No. 5,402,305 by Asada et al., as is discussed below. As is disclosed by Asada et al.:

Pd powder begins to oxidize and expand at about 500°C which is lower than the sintering temperature of ordinary ceramics . . . In particular, fine Pd powder has a high oxidation activity and oxidizes almost completely to cause an increase in its weight by about 15%. (Col. 1, lines 31-38)

There is nothing in the disclosure of Dietz to suggest that the palladium-containing powders are any different or are processed any differently to reduce oxidation of the palladium. Therefore, it is submitted that Dietz does not disclose or suggest palladium-containing powder having such oxidation resistance.

Applicants have added new Claims 168-171, which depend upon Claim 143. Support for new Claim 168 can be found at paragraph [0238] of the published application (2004/0247782). Support for new Claim 169 can also be found at paragraph [0238] of the published application. Support for new Claim 170 can be found at paragraph [0306] of the published application. Support for new Claim 171 can be found at paragraph [0310] of the published application.

New Claim 168 recites that the metallic phase comprises greater than about 50 wt.% palladium and new Claim 169 requires that the metallic phase include greater than about 60 wt.% palladium. Dietz only discloses particles containing a metal phase having 17.6 wt.% palladium. New Claim 170 recites that the metallic phase further comprises silver. Dietz does not disclose or suggest Ag-Pd alloys. New Claim 171 recites that the particles demonstrate a maximum weight gain of less than about 30 percent relative to the theoretical weight gain for complete oxidation of the palladium. As is discussed above, Dietz does not disclose or suggest palladium particles having such a high oxidation resistance.

With respect to independent Claim 144, Applicants respectfully submit that Dietz does not disclose or suggest the utilization of *multiphase* particles having a first material phase comprising palladium and a second material phase being substantially free of palladium. Specifically, it is submitted that the passage referred to by the Examiner refers to a *mixture* of individual particles, and not to particles that include both a first

material phase and a second material phase within the same particle. That is, Dietz does not state that each particle includes the listed components. Nowhere in the specification of Dietz are these powders described as being multiphase or composite in nature. Therefore, removal of this rejection with respect to Deitz is requested.

Independent Claim 144 has been amended to recite that the second material phase is at least about 0.5 weight percent of the particles. Support for this amendment can be found in paragraph [0247] of the published application. New Claim 172 has also been added and support for this amendment can be found at paragraph [0247] of the published application. New Claim 172 requires that the multiphase particles include not greater than about 10 weight percent of the second material phase.

The Examiner has rejected Claims 143-147 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,402,303 by Asada et al. The Examiner states that Asada discloses forming palladium particles 0.6 micron in size and further containing a small amount of a second material. The Examiner also states that the second material is held by the examiner to be "dielectric" in accord with Claim 147, in the absence of any numerical definition of this term. The Examiner stats that Tables 1-3 of Asada discloses examples in which the oxidation rate of the palladium (relative to theoretical complete oxidation) is less than the 40% maximum permitted by instant claim 143. The Examiner states that these particles are mixed with ethylcellulose and a solvent to form a paste, which is printed onto a barium titanate green sheet, see Asada Col. 6, lines 7-28.

The Examiner also states that Asada does not specify the crystallite size of the particles as recited in instant Claim 143, and does not disclose the size distribution limitations recited in instant claim 144. The Examiner states that these differences are not seen as resulting in a patentable distinction between the prior art and the claimed invention because the Adada method does not limit the crystallite size and would include processes performed using particles having the presently claimed crystallite size. The Examiner states that this aspect of the claimed invention is held to be within the purview of the process disclosed by Adada. The Examiner also states that noting in the Asada disclosure would indicate that any significant amount of the metal particles are more than twice the average size. The Examiner states that a prima facie case of

obviousness is established between the disclosure of Asada et al. and the presently claimed invention.

Applicants have amended independent Claim 143 to recite that the metallic phase is substantially free of alkaline earth metals. Support for this amendment can be found in the published application at paragraph [0314]. As is disclosed therein, it has surprisingly been found that the palladium-containing particles have excellent resistance to palladium oxidation, and that alkaline earth metals are not necessary to achieve such oxidation resistance. Asada et al. is only directed to palladium containing particles having such metals to increase oxidation resistance. Indeed, in the comparative examples illustrated by Asada et al. (e.g., Tables 1 and 2) the oxidation resistance of the palladium-containing particles with no or very low rare earth metal content exhibit a *high* rate of oxidation.

In view of the foregoing, removal of this rejection with respect to Claim 143 and Claims 168-171 which depend upon Claim 143 is requested.

Independent Claim 144 has been amended to recite that the multiphase particles include at least a first material phase comprising palladium and at least 0.5 weight percent of a second material phase that is substantially free of palladium. Asada et al. do not disclose or suggest particles having greater than 0.5 weight percent of a second material phase. Therefore, removal of this rejection is requested.

The Examiner has also rejected Claim 152 under 35 U.S.C. 103(a) as being unpatentable over Asada et al. in view of Dietz. The Examiner states that Asada, described supra, does not specify heating the particles to a temperature as recited in the instant claim. The Examiner also states that Dietz, Col. 7, line 33 indicates that it is known in the art, at the time of the invention, to employ a temperature as presently claimed when making films from metal-containing particles by a substantially similar process. The Examiner states that the disclosure of Dietz would have rendered the use of a temperature as presently claimed obvious in the process as disclosed by Asada et al.

Claim 152 depends upon Claim 144, which is discussed above. Specifically, Asada et al. does not disclose or suggest multiphase particles having at least 0.5 weight percent of a second material phase. Dietz does not disclose or suggest multiphase particles. Therefore, removal of this rejection is also requested.

The Examiner has provisionally rejected Claims 143-153 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 133-148 of copending U.S. Patent Application No. 10/774,791 (now US Patent No. 7,004,994). The Examiner states that although the conflicting claims are not identical, they are not patentably distinct from each other because both the instant claims and the '791 claims are directed to a process of forming films on a substrate by firing pastes including small noble metal particles of a certain size and distribution, and further including many substantially identical limitations in their respective dependent claims; compare instant claims 145-152 with '791 claims 133-141. The Examiner states that the '791 claims involve making a silver-containing film, as opposed to making a palladium-containing film in the instant claims. The Examiner also states that however, that the paste of '791 claim 143 includes not only "particles including silver" but also second particles including palladium and also that both the instant claims and the '791 claims employ open language with respect to the composition of the particles, e.g. the claims refer to palladium-containing and silver-containing films and particles, and are thus open to the inclusion of additional materials. The Examiner states that thus, no patentable distinction is seen between the process as recited in the '791 claims and that of the instant claims. The Examiner states that this is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Applicants request that the foregoing provisional rejection be held in abeyance until the indication of otherwise allowable subject matter.

Applicants do not believe that any additional fees are due with the filing of this Response. However, if any such fees are due, please debit those fees to Deposit Account No. 50-1419.

Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecute and or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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